

REMARKS

Claims 1-7 and 9-12 are currently pending in this application. By the present Amendment, claim 1 has been amended and claim 8 has been canceled. Applicant respectfully submits that no new matter has been introduced into the application by these amendments.

Claim Rejections – 35 U.S.C. §103

In the Action, claims 1, 6 and 9 were rejected under 35 U.S.C. §103 as unpatentable over the combination of U.S. 5,910,273 to Thiel et al. ("Thiel et al. '273) and U.S. 6,428,737 to Collette et al.

Applicant has amended claim 1 to include the subject matter of claim 8. Accordingly, this rejection has been rendered moot.

Claims 2 and 5 were also rejected under 35 U.S.C. §103(a) in view of Thiel et al. '273 and Collette et al. further in view of U.S. 3,705,025 to Daniels.

Applicant notes that this rejection has also been rendered moot by the amendment to claim 1 to incorporate the subject matter of claim 8.

Claims 10-12 were also rejected under 35 U.S.C. §103 as unpatentable over the combination of Thiel et al. '273 and Collette et al. further in view of U.S. 6,667,112 to Prasad et al.

Applicant notes that the amendment to claim 1 has also rendered this rejection moot.

Claims 3, 4 and 8 were rejected under 35 U.S.C. §103 as unpatentable over the combination of Thiel et al. '273 in view of Collette et al. further in view of U.S. 5,916,498 to Hofmann et al. Applicant respectfully traverses this rejection in view of amended claim 1 which incorporates the subject matter of canceled claim 8.

As amended, claim 1 is directed to a method to a method for producing a ceramic part formed as a denture, artificial tooth or bridge. The method includes powder injection molding at least one ceramic powder and one binder into an inner cavity of a molding tool under the effective heat and/or pressure and then solidifying this into a green body preform to form a first component. After injection molding this green body preform, the method further includes injection molding at least one other ceramic molding material as a second component on the previously produced green body preform under the effective heat and/or pressure in at least one other injection molding process to form a multi-component green body preform. The molding materials of at least two of the powder injection molding processes differ from each other. The multi-component green body preform thus formed is subjected to binder stripping and sintering to form the final ceramic part. The ceramic powder of the at least one powder injection molding process is formed such that the ceramic component of the final ceramic part formed from one of the first and second components is transparent or translucent, and the ceramic powder of an other of the powder injection molding processes is formed such that a ceramic component of the final ceramic part produced from the other of the first or second components is less transparent than the part of the final ceramic part produced from the one of the first or second components that is transparent or translucent.

Thiel et al. '273 is relied upon as teaching an injection-molded ceramic and binder composite material used to form a green body for a dental prosthetic. The binder is burned out in a second step prior to sintering. This green body can be jacketed with a ceramic layer having different optical properties for aesthetic reasons. It is admitted that this reference does not teach a two-step molding for ceramics wherein the second material is molded on to the green body, effectively coating it. Collette et al. is relied upon as teaching a two-step molding operation

with different materials. While the Action states that Collette et al. is combinable due to the teaching of ceramic injection molding, in fact Collette et al. is directed to molding polymeric materials such as PET polymer, PEN homopolymer or copolymer blends and is not directed to molding ceramic materials. The referenced figures of Collette et al., in particular Figures 1a and 1b, show the first step for molding a core for a water bottle which is then cooled and removed from the first mold cavity as shown in Figure 1b prior to insertion into a second mold cavity in which the outer material is molded over the inner material in order to form a preform for a blow-molded water bottle which is formed in a later blow-molding operation from the preform. This process of Collette et al. involves separate injection molding and cooling operations between steps in a process that is wholly different from both Thiel et al. '273 and the present invention. Thus, it is not apparent how these references from totally different fields which are molded in entirely different manners can be combinable as suggested in the Action.

The Thiel et al. '273/Collette et al. combination is further modified in the Action through the application of Hofmann et al., which specifically teaches veneering a finished glass-ceramic part with a ceramic powder composition or ceramic composition slurry which is painted or otherwise applied to the dental prosthetic part formed in accordance with Hofmann et al. which is then fired a second time in an oven at a temperature less than the firing temperature of the previously formed ceramic/glass part. See in particular column 11, lines 25-33. Here, the firing temperature of the veneering material must be lower than the firing temperature of the first part so that the first part remains stable as the veneer is sintered onto it via the second firing process.

This combination, in contrast to the present invention does not provide any suggestion or motivation for the initial part of the recited method of injection

molding at least one other ceramic molding material as a second component on the previously produced green body preform under the effective heat and/or pressure and at least one other powder injection molding process and further provides no suggestion or motivation for making these first and second preform components from ceramic powders having different material properties such that the ceramic component (16) of the final ceramic part produced from one of the first or second components is less transparent than the part of the final ceramic part produced from the other of the first or second components (18).

While the portion of Hofmann et al. referenced in the Action recites powdered ceramic compositions of superior translucency or colored to approximate natural tooth colors that is applied over the molded dental prosthesis to veneer its surface, there is no suggestion of forming a denture, artificial tooth or bridge in accordance with the present invention where the entire firing process is a single step which provides a more translucent outer surface and an opaque ceramic component behind this translucent or transparent outer surface to more accurately mimic tooth colors.

Applicant notes that a similar amendment in the corresponding European application combining claims 1 and 8 resulted in the claims being patentable as this process for providing differentiated transparencies in a multi-component ceramic dental prosthesis which can be formed in a single firing step was neither suggested nor disclosed in any combination or prior art considered.

In view of this, withdrawal of the Section 103 rejection of amended claim 1 is respectfully requested.

Claims 2-7 and 9-12 depend directly or indirectly from claim 1 and should be similarly patentable for the reasons noted above in connection with claim 1.

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Conclusion

If the Examiner believes that a telephone interview will help to advance the prosecution of this application or that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

In view of the foregoing Amendments and Remarks, applicant respectfully submits that the present application, including claims 1-7 and 9-12, is in condition for allowance, and a Notice to that effect is respectfully requested.

Respectfully submitted,

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